REDUCING ENERGY CONSUMPTION - STREET LIGHTING

Report By: The Director of Environment and Culture

Wards Affected

County-wide

Purpose

1. To seek the views of members on the options for reducing the energy consumed and carbon dioxide generated through street lighting.

Financial Implications

2. None as a result of this report. However the implementation of any of the options identified may have positive and/or negative implications which will need to be considered when deciding whether to proceed.

Background

3. At their meeting of the 15th September 2008 the Environment Scrutiny Committee raised the following question 'In view of light pollution, rising electricity costs and the need to meet carbon emissions targets (NI185) it was asked whether street lights could be turned off e.g. after midnight, light levels reduced or low energy light bulbs used?' They acknowledged that 'the suggestion would have to be balanced against other social expectations e.g. personal security and crime levels.' and the Committee requested a report to the next meeting.

4. The energy currently used to illuminate our street lights is supplied from a green source and at a very favourable rate of approximately 6.5p a unit. This arrangement expires on the 1st April 2009 and in the current economic climate our supply is likely to significantly increase in cost, particularly if we are able to continue with a green energy source. This represents a pressure on the revenue budget of £250,000.

5. Street lighting energy is traded through two methods, half hour (HH) and non-half hour (NHH) trading. The Council's existing supply contract trades on the NHH method. HH trading generally offers saving over the NHH method and these can be up to 12%. To move from NHH to HH trading we must seek approval from the Distribution Network Operator (DNO) that our inventory is accurate and appoint an accredited meter administrator to calculate the energy consumption using a combination of our inventory data and software owned by the unmetered supply operator. Most suppliers, including the existing supplier can provide this service, and we are overhauling our inventory to ensure that it can be approved by our host DNO.

6. Our estimated annual energy consumption in street lighting totals 4 giggawatt hours and this will push us above the Carbon Reduction Commitment (CRC) threshold, which has financial implications if street lighting goes onto half hourly metering. Being above the

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CRC threshold will cost the Council an estimated minimum of £150,000 in carbon credits during the coming financial year.

7. The Institution of Lighting Engineers (ILE) reports that Britain's energy consumption per annum is 317,832 gigawatt hours, yielding 560 million tonnes of carbon dioxide. Some 19% of this is attributable to lighting in general and only 0.6% is actually created by exterior lighting (predominantly street lights).

8. Whilst greater energy savings can be found through controlling unnecessary domestic lighting, switching off street lighting is a very visible measure that can be employed to promote energy saving policies in the community. But it is not necessarily the safest way of securing change.

9. The ILE does recognise that switching off lighting in a planned way can have a long term and positive effect on street lighting budgets. They do however suggest that in the short term there is little overall saving in energy, or costs, in adopting a part-night or switch-off policy for street lighting. This is because the cost of removing a street light (they estimate at £400 per column) equates to ten years' running costs, or converting to part night running (at about £100, per column) equates to 2.5 years running costs. However such measures would reduce carbon emissions and so contribute to our carbon reduction targets.

10. The presence of street lighting is often cited as a deterrent against crime, disorder and anti-social behaviour. These issues are not necessarily intrinsically linked at all locations. Similarly, the link between road safety and street lighting is not necessarily direct, and is highly dependant on the circumstances of each site.

11. However, the links between the perception of safety and street lighting are more direct in the minds of the public and it is this that has led to many 'alarmist' headlines in reaction to other authorities' proposals to switch off street lights.

Current initiatives by other authorities.

12. Recently there have been a number of reports in the press in reaction to Powys County Council's 10 week trial which began in mid October 2008. The objective of this trial is to switch off two out of three street lights in non-sensitive areas and save £225,000 in the process. Powys is responsible for 14000 street lights, a figure that is comparable to our own. We await with interest the results of this trial, which has been undertaken by disconnecting each lighting column at its cut out and leaving the lamp in situ. This is obviously not a long term approach, and street lighting engineers do have concerns over the deterioration of street light, even over such a short period, and the resulting need to replace many components in the event of recommissioning.

13. Powys is not alone in undertaking trials, most notable are Buckinghamshire County Council, who commenced a two phased trial in August 2007. This trial, which is set to last for three years saw 300 street lights being switched off at 7 semi-rural and rural sites as part of phase 1, and a further 1700 being switched off at 39 rural and semi-rural sites as part of phase 2, which took place between May and August 2008. Their initial consultation revealed 62% support for the principles of switching off street lights to save energy and reduce carbon emissions. They predict that phase 1 will save £15,000 a year in energy costs and 90 tonnes of carbon dioxide; phase 1 and 2 combined will save £100,000 in energy and a 10% saving in their total carbon emissions of 590 tonnes of carbon dioxide. As part of their approach a safety audit is undertaken at each site and

improvements in signing, road studs, road markings and foliage are completed before switching the lights off. Buckinghamshire CC has yet to draw their conclusions from the trial, but they have felt confident enough in the findings of phase 1 to progress to phase 2. Clearly this approach requires investment in highway improvements to be undertaken in advance of any savings being realised.

Potential options.

14. There are alternatives to simply switching lights off and the ILE have produced an advice note which aims to suggest alternative proposals which will keep street lighting lit whilst helping to reduce costs and the impact of street lighting on the environment, through reduced discharge of greenhouse gasses and reducing the effects of light pollution. They conclude that the cost of electrical energy can be reduced, but the measures needed generally require authorities to 'invest to save'. The cost of converting to part night lighting is less than variable level (dimming) control gear. Careful choice of lamp type is important and they recommend that when replacing control gear or luminaires the opportunity is taken to replace the control gear with full electronic control gear.

15. The range of possible options, an initial view on the potential level of advantage/disadvantage to Herefordshire, together with an indication of how quickly any benefits could be realised, is summarised in the table below:

Option	**Potential advantage/disadvantage**	**Potential timescale**
Dimming - This involves installing a device which allows light levels to be varied in relation to the level of usage.	Highly beneficial at selected sites. Can be costly to introduce.	Medium term could be introduced as part of selected highway improvement and street lighting schemes.
Trimming -This is simply a reduction in the number of hours a lamp is lit.	Moderately beneficial, provides a reasonable compromise solution of switching lights off.	Short to medium term could be introduced as part of the street lighting maintenance cycle.
24 hour burners - Generally only closed subways require continuous lighting therefore any signs or bollards which are currently lit for 24 hours can be fitted with photo electric cells, this will effectively half their energy requirements.	Limited benefit, as we have few sites that are lit 24 hours.	Short term.
De-illuminate signs – The Traffic Signs Regulations and General Directions (TSRDG, 2002) details require requirements for lighting road signs. Some signs will be illuminated that are no longer required to be. These lights can be switched off.	Limited benefit as the majority of energy is consumed by street lights as opposed to signs. But should not be discounted.	Short to medium term, will require an audit of the inventory of illuminated signs.
Bollards - Take advantage of the relaxation to de-illuminate	Limited benefit as the majority of energy is consumed by street	Short to medium term, will require an audit of the inventory

bollards or fit solar powered LED bollards. Approval from the Department for Transport is required in some instances but many bollards, for example plain faced bollards no longer require illumination.	lights as opposed to signs. But should not be discounted.	of illuminated bollards.
LEDs – Development in LEDs is still ongoing and but whilst cost effective street lighting units are in reality still not available there are many opportunities to utilise both the energy, but more so the maintenance savings, that LED's offer. Cost effective LED signs and bollards are now available and should there be a requirement for illumination.	Limited benefit as the majority of energy is consumed by street lights as opposed to signs and bollards. But should not be discounted.	Short to medium term, will require an audit of the inventory of illuminated bollards.
Electronic control – Conventional control gear can significantly increase the total circuit wattage for a lamp. Electronic control gear offers energy savings and can extend the life of the lamp.	High.	Short to medium term, being pursued as part of the street lighting maintenance cycle.
White light - Take advantage of reduction of lighting levels in residential areas by using 'white light' light sources.	Medium.	Medium to long term, introduced as part of the programme of street lighting maintenance/improvement works.
Part night lighting – Consideration in rural areas may be given to part night lighting, whereby lighting is switched off in residential areas from say midnight to 5:00am	Highly beneficial in carefully selected areas.	Short to medium term, if pursued as part of the street lighting maintenance cycle.
Switching lights off – As explored by Powys County Council, Buckinghamshire County Council and others.	Potentially highly beneficial in carefully selected areas.	Medium to longer term, if introduced as per the Buckinghamshire CC approach.

16. The Street Lighting Team has been exploring the options for part night lighting and dimming in line with the ILE recommendations. It should be noted that we have an existing programme of replacement, through which we continue to replace our existing lanterns, with more energy efficient units. We anticipate being able to recover the initial investment in changing to a combination of half night and dimming within 3 years of implementation. The cost of dimming equates to £70 per column and for half night

electronic cell £18 per light. We have approximately 14500 lighting units across the county.

RECOMMENDATION

THAT Members comment on the content of this report.

BACKGROUND PAPERS

- Institute of Lighting Engineers Interim Advise Note LB1: 'Street Lighting – Invest to Save'.
- Traffic Signs Regulations & General Directions 2002.
- Buckinghamshire County Council's Report to Cabinet Member for Transportation dated the 12th November 2007 titled 'Switching Off Street Lights to Save Energy Trail – Phase 2' together with supporting information from the BCC web site.
- Herefordshire Council's Carbon Management Action Plan Summary.
- Powys County Council Web Site.

Further information on the subject of this report is available from
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